MISSOURI BOTANICAL GARDEN
St. Louis, Missouri

1. Zapalote chico.

The following reference has long been difficult to obtain:

Zapalote Chico: An Important Chapter in the History of Maize and Man. Congreso de Americanistas, San José, Costa Rica, 1959.

Zapalote Chico has been described and illustrated in Wellhausen, et al., 1952 and in Wellhausen, et al., 1958. The substrain described in this note was collected by Jonathon Sauer in 1947 in a conservative community and exhibits the very distinctive characters of Zapalote Chico more markedly than any other collection. As discussed on page 233, it is virtually independent of length of day. Transferred directly from southern Mexico to Minnesota, it produced normal plants only slightly taller than those grown in Mexico. It therefore might play a unique role in experiments on the basic physiology of maturity in maize or in studies on the genetics of photoperiodic response.

Xeroxed copies of the paper are available from Edgar Anderson, Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Missouri, 63110.

A limited amount of seed of this strain is in cold storage and can be obtained by writing to: Dr. William L. Brown, Vice President and Director of Research, Pioneer Hi-Bred Corn Company, 1206 Mulberry Street, Des Moines, Iowa, 50308.

Edgar Anderson

UNIVERSITY OF MISSOURI
Columbia, Missouri

1. Negative interference.

The aim of this present study was to explore further the occurrence of an apparent negative interference component associated with the long arm of chromosome 1 (see Maize News Letter 42:129-132).

Statistical analyses were done on backcross data from material which was either structurally normal or heterozygous for one of several

translocations. Two inbred backgrounds, 6X3, a Coe standard, and 4Co63, a Brink standard, were used.

The long arm of chromosome one was divided into four regions: $br-an_1$ (region 1), $an_1-bz_2$ (region 2), $bz_2-gs_1$ (region 3), and $gs_1-bm_2$ (region 4). From all samples individual recombination values were calculated for the raw data from all four regions. Average recombination values were obtained $(\bar{p}_n)$ by dividing the total number of recombinants by the total number of individuals free from structural aberrations for each interval population. This value was used both in the heterogeneity calculations and as the mean to which individual recombination frequencies were compared to identify those which were higher than the average from those which were lower. In addition, the standard errors for the $p_i$ values were calculated to determine fit, that is, percentage of the time a given recombination frequency higher or lower than the mean would be expected by chance.

Using $\bar{p}_n$, two different heterogeneity calculations were made. First, determination was made as to whether or not the intervals carried on two structurally normal chromosomes were homogeneous. Second, a similar set of calculations was made using the translocation heterozygotes.

Coincidence calculations were made on all pertinent double exchanges. In addition, the probabilities of these values occurring by chance in a population whose true coincidence was one were determined.

Five graphs were constructed as a result of the preceding statistical analyses. The first relates fit to a coincidence of one, separating those with c less than one from those with c greater than one, to frequency. The remaining four graphs relate fit to $\bar{p}_n$ for each region in a similar manner to the one described directly above. Finally, $x^2$ tests were made, where fit to the experimentally determined ratio, i.e., ratio of coincidence less than one to that greater than one, was tested with regard to background, translocation bearing samples versus normal sibs and adjacent intervals.

The preceding analyses yielded the following information:

1. Heterogeneity was associated with neither structural configuration.

2. The general tendency of the translocations was to reduce

recombination in this study.

3. The $X^2$ tests failed to show significance, that is, to affect distribution when the parameters of structural constitution, background and adjacency were considered.

4. The negative interference effect previously reported to be associated with the whole arm has been found to be a property of region 2 specifically, as indicated by $X^2$ tests which tested the distribution for pairs of regions against empirical proportion determined from the first graph described.

Detailed description of the results and their theoretical implications are forthcoming in a paper soon to be published.

S. L. Goldman

## 2. Structure of $an_{6923}$

An experiment was made in which $\pm$ $+/an_{6923}$ $bz_2$ was crossed to $an_1$, $bz_2$. Both the bronze and purple seed classes were planted. Of the 4,952 bronze seeds recovered, all gave rise to plants which were anther ear in phenotype. Of the 5,048 plants derived from fully colored seed, no instance of anther ear phenotype was noted.

In a population of 10,000 gametes, ten crossovers are expected between $an_1$ and $bz_2$, since the map distance separating them in the control amounted to 0.1 of a map unit. The failure to obtain any crossovers when $an_{6923}$ was involved is further support for the idea that this may indeed be a pollen transmissible, homozygous viable deletion.

S. L. Goldman

## 3. Survival kinetics of pollen grains in aqueous medium.

Pollen of ACR stock was mixed with 25 ml of aqueous medium (Newsletter 42:126) and applied sequentially with a #8 brush to silks of a colorless $F_1$ hybrid, W23/M14. Colored kernels were counted at harvest.

Five experiments were conducted (Table 1). In Expt. A, substantial spilling occurred in the haste of keeping to 5-sec. intervals; these numbers of ears and kernels are adjusted to account for spillage. Estimates indicate $2.5 \times 10^6$ pollen grains per cc of dry pollen, so the overload (in thousands of pollen grains per kernel) was both extreme and